Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of the Claims:

1. (previously presented) A laser, comprising:

a first optically reflective element;

a second optically reflective element opposed to and aligned with said first optically reflective element to define a laser cavity having an optical axis;

a laser dye gain element having a laser dye and which is interposed between said first and second optically reflective elements along said optical axis for transforming an optical pump signal into a resonant optical signal;

a laser diode system for generating and injecting said optical pump signal into said laser cavity along said optical axis, where said optical pump signal is a sequence of optical pulses having a pulse width of about $n\tau_f$, where τ_f represents a fluorescence lifetime of said laser dye, and $3 \leq n \leq 25$ so that said laser diode system operates in a non-steady-state mode.

2. (original) The laser of claim 1 wherein said optical pump signal has a pulse period in the range of about 1 Khz to 1 Mhz.

3. (original) The laser of claim 1 wherein said laser dye gain element includes a host material selected from the group that includes porous glass, plastic, and sol-gels.

4. (original) The laser of claim 3 wherein said plastic consists essentially of modified polymethyl methacrylate.

5. (original) The laser of claim 1 wherein said first optically reflective element has a curved reflective surface.

6. (original) The laser of claim 5 wherein said first and second optically reflective elements define a nearly hemispherical resonator.

7. (previously presented) A method for generating a laser output signal, comprising the steps of:

operating a diode laser system in non-steady-state mode by generating an optical pump signal that is a sequence of optical pulses each having a pulse width of about $n\tau_f$, where τ_f represents a fluorescence lifetime of a laser dye and $3 \leq n \leq 25$;

directing said optical pump signal into an optical resonant cavity having a laser dye gain element that contains said laser dye for transforming said optical pump signal into an excited optical signal;

resonating said excited optical signal in said optical resonant cavity; and
emitting a portion of said excited optical signal from said optical resonant cavity.

8. (original) The method of claim 7 wherein said optical pump signal has a pulse period in the range of about 1 Khz to 1 Mhz.

9. (original) The method of claim 7 wherein said laser dye gain element includes a host material selected from the group that includes porous glass, plastic, and sol-gels.

10. (previously presented) The method of claim 9 wherein said plastic consists essentially of modified polymethyl methacrylate.

11. (previously presented) The method of claim 7 wherein said optical resonant cavity is a nearly hemispherical resonator.

12. (canceled)

13. (previously presented) A method for generating a laser output signal, comprising the steps of:

operating a laser diode system in a non-steady-state mode by generating an optical pump signal that is a sequence of optical pulses each having a pulse width t, wherein $0.950 \leq 1 - e^{-t/\tau_f} \leq 0.993$, and τ_f represents a fluorescence lifetime of a laser dye;

directing said optical pump signal into an optical resonant cavity having a laser dye gain element which contains said laser dye that is characterized by said fluorescent lifetime, τ_f, for transforming said optical pump signal into an excited optical signal;

resonating said excited optical signal in said optical resonant cavity; and

emitting a portion of said excited optical signal from said optical resonant cavity.